

## SMELT WORKING GROUP

Monday, April 13, 2015

### Meeting Summary:

The Working Group agreed that given present distribution, current salvage, and Delta conditions, there was no indication that the projected combined exports of approximately 1500 cfs for the week (potentially resulting in daily average OMR flows of approximately -1900 cfs) need to be modified for the protection of Delta Smelt adults and larvae.

The Working Group is following guidance for entrainment protections from both Action 2 (adult Delta Smelt) and Action 3 (juvenile Delta Smelt).

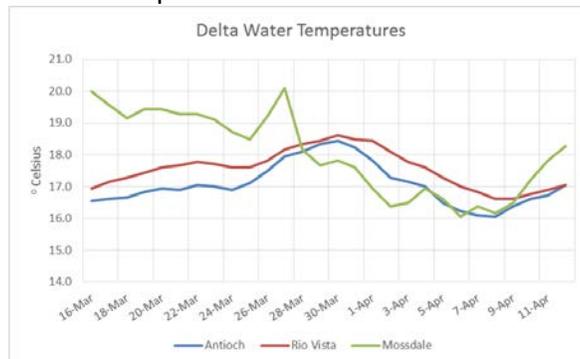
The Working Group also agreed that given their present distribution, existing constraining conditions were sufficient to protect longfin smelt from entrainment in the southern Delta.

The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions and will meet again Monday, April 20, 2015 at 10 am.

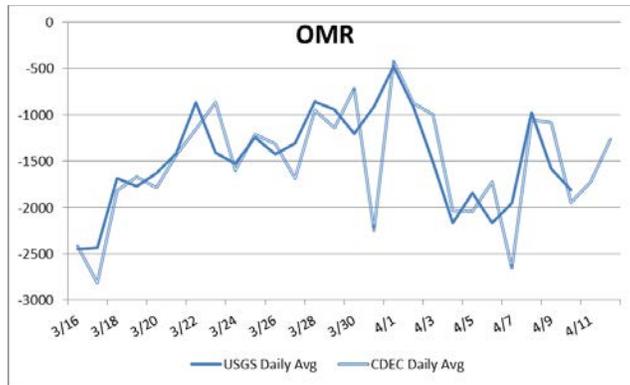
### Reported Data:

#### 1. Current environmental data:

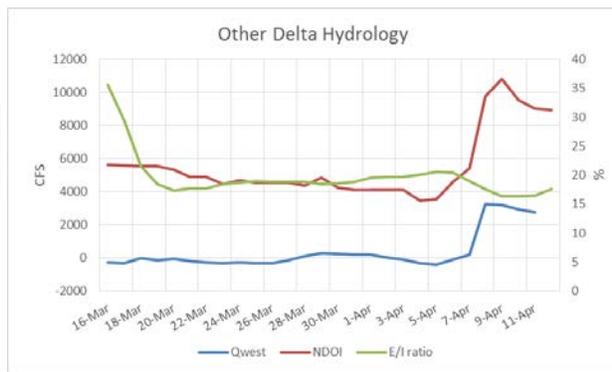
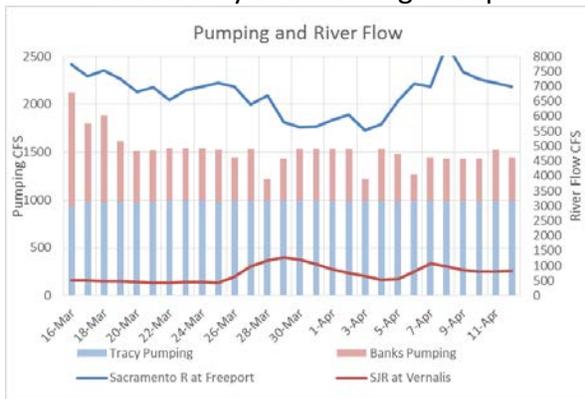
- Since February 3, it has been warm enough for Delta Smelt to spawn throughout much, or all of, the Delta. Water temperatures since March 16 are as follows:



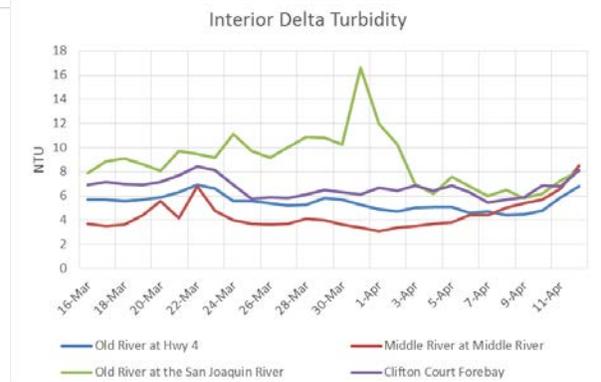
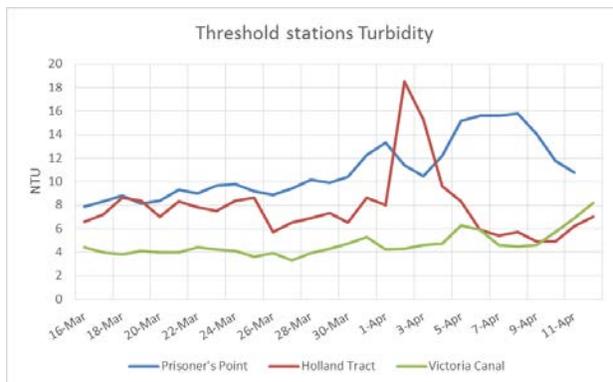
- OMR Flow: USGS tidally-averaged daily, 5-day, and 14-day average OMR flow for April 10 was -1814, -1700, and -1381 cfs, respectively. CDEC daily, 5-day average, and 14-day average OMR flow as of April 12 was -1270, -1416, and -1485 cfs, respectively.

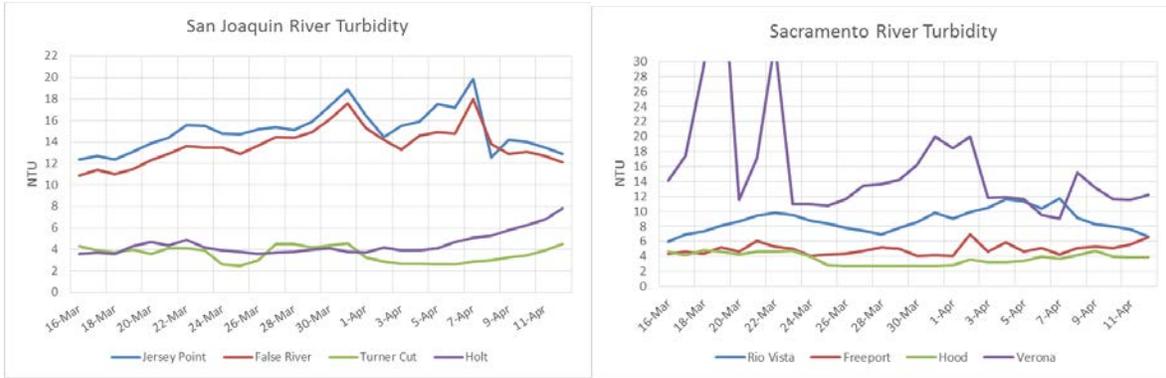


- River Flows: Sacramento River inflow is 6986 cfs and San Joaquin River is 822 cfs. X2 calculation from CDEC has been upstream of Collinsville since March 9. The graphs below show the most recent trends in Delta hydrology and water quality that were evaluated by the Working Group



- Turbidity:





## 2. Delta Fish Monitoring:

The 2014 Fall Midwater Trawl Annual Index for Delta Smelt is 9. This is the lowest reported fall index since the beginning of this survey in 1967, and approximately one half of the previous lowest indices of 17 (2009) and 18 (2013).

20-mm Survey #2 was in the field starting March 30 and continued through April 8. Processing is 95% complete. One Delta Smelt was caught at station 812 (9 mm) and one at station 707 (15 mm). 20-mm Survey #3 is in the field this week.

Spring Kodiak Trawl #4 was in the field last week. A single ripe male (66 mm) Delta Smelt was caught at station 719. One 27 mm Delta Smelt was also caught at station 719 (positive identification of this fish as a Wakasagi was made on April 14, 2015).

The Service's Early Warning Survey concluded sampling for the season on March 31.

## 3. Salvage:

Delta Smelt have not been observed in salvage counts since February 21. The estimated cumulative seasonal total (CVP and SWP combined) for adult Delta Smelt salvage is still 68. No adult Longfin Smelt has been observed in salvage counts during WY 2015. Young-of-year Longfin Smelt have not been observed in salvage counts since March 29. The total salvage for the season is 8. No larval Delta Smelt was reported for the last week. Both the SWP and CVP operated their fish facilities with normal 30 minute counts this past week. The CVP had one short outage to conduct work on the Hydrolux traveling screen.

## 4. Expected Project Operations:

Combined SWP/CVP exports today are approximately 1500 cfs. Operators indicated that they expect the OMR flow to be approximately -1900 cfs for the week, but could change depending on how much of the pulse flow reaches Vernalis. Combined exports have returned to being restricted by the Temporary Urgency Change Petition, which restricts pumping to 1500 cfs when water quality standards have been exceeded.

## 5. Delta Conditions Team:

There was no advice for the SWG.

## 6. Assessment of Risk:

### Background:

RPA Component 1: “Beginning in December of each year, the Service shall review data on flow, turbidity, salvage, and other parameters that have historically predicted the timing of Delta Smelt migration into the Delta. On an ongoing basis, and consistent with the parameters outlined... [in the BO]...the SWG shall recommend to the Service OMR flows that are expected to minimize entrainment of adult Delta Smelt” (page 280).

RPA Component 1, Action 2: “An action implemented using an adaptive process to tailor protection to changing environmental conditions after Action 1. As in Action 1, the intent is to protect pre-spawning adults from entrainment and, to the extent possible, from adverse hydrodynamic conditions.”

“The range of net daily OMR flows will be no more negative than -1,250 to -5,000 cfs. Depending on extant conditions (and the general guidelines below) specific OMR flows within this range are recommended by the Working Group from the onset of Action 2 through its termination...” (page 352).

RPA Component 2, Action 3: “The objective of this RPA component (which corresponds to Action 3 in Attachment B), is to improve flow conditions in the Central and South Delta so that larval and juvenile delta smelt can successfully rear in the Central Delta and move downstream when appropriate” (page 282).

“Upon completion of RPA Component 1 or when Delta water temperatures reach 12°C (based on a 3-station average of daily average water temperature at Mossdale, Antioch, and Rio Vista) or when a spent female delta smelt is detected in the trawls or at the salvage facilities, the projects shall operate to maintain OMR flows no more negative than -1,250 to -5000 cfs based on a 14-day running average with a simultaneous 5-day running average within 25 percent of the applicable 14-day OMR flow requirement. Depending on the extant conditions, the SWG shall make recommendations for the specific OMR flows within this range from the onset of implementing RPA Component 2 through its termination. The Service shall make the final determination regarding specific OMR flows. This action shall end June 30 or when the 3-day mean water temperature at Clifton Court Forebay reaches 25° C, whichever occurs earlier” (page 282).

### Discussion:

The Working Group reviewed and discussed all relevant data from Delta flow and water quality monitoring, salvage, field surveys, and planned Project operations.

The Service presented its updated WY2015 adult Delta Smelt ITL (196 fish) and early warning level (78 fish) at the January 12 SWG meeting. The January 9, 2015 reinitiation memo regarding these updated levels has been posted to the Bay-Delta FWO website (<http://www.fws.gov/sfbaydelta/>). The WY 2015 juvenile Delta Smelt ITL is 504, based on a WY 2014 FMWT index of 9.

Three-station average water temperature surpassed 12°C as of February 3, 2015. The Working Group is now looking to Action 3 of the Biological Opinion as well as Action 2 in framing their advice to the Service. The 3-station average water temperature as of April 12 was 17.5°C.

Members discussed the results from last week's SKT #4 survey. A preliminary review of historical SKT data indicated that this is a record low catch for SKT# 4. The previous lowest catch for SKT #4 occurred in 2010, when the total Delta Smelt catch was 14\*. Last month's SKT catch of Delta Smelt (6 individuals) was a historical low for SKT #3.

During the 03/16/2015, Working Group meeting, members discussed potential reasons for the SKT #3 low catch. In addition to the fact that overall abundance is low, some members discussed that Delta Smelt could possibly be moving lower in the water column for temperature refugia. With record low Delta Smelt catch from SKT #4, members indicated they are more confident that results from this year are not an anomaly and even that it appears that fish density has become so low that the survey has reached or gone below its minimum effective detection ability. Members also mentioned the results from the 20 mm #2 survey, which only caught two juvenile Delta Smelt. Previously, members had suspected that sufficient numbers of young Delta Smelt had not reached a retainable size for the equipment. However, due to the detection of a 27 mm Delta Smelt in last week's SKT survey\*\*, members indicated this could be evidence that the numbers from this year-class are exceptionally low.

Based on a review of the Delta Smelt distribution and salvage data, current Delta conditions and projected operations, the SWG agreed that no change in operations is necessary for the protection of Delta Smelt. The SWG will continue to monitor turbidity, salvage and survey data through this week, and will request a call to discuss Delta Smelt entrainment risk, should one be necessary.

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Monday, April 20, 2015.

\*Post-meeting additional note: the total number of Delta Smelt caught in survey 4 year 2010 and is 74. However, this value is disproportionally influenced by high catch at Station 719 (Sac Deep Water Channel) which did not become part of the SKT survey until year 2005 beginning with survey 2. The estimate discussed during the meeting did not include station 719. Excluding St 719, the lowest catch in survey 4 was just 9 Delta Smelt and it coincidentally occurred in 3 years over the period 2003-2014 (2006, 2008, 2014). The highest catch occurred in year 2012 (138 Delta Smelt). If we exclude this year's catch in St 719 in survey 4 we would then have zero Delta Smelt which supports the all-time record low for this survey

\*\*Post-meeting additional note: See note added to Delta Fish Monitoring section indicating the 27 mm fish caught in the SKT survey was actually a Wakasaki.

## WEEKLY ADVICE FOR THE DEPARTMENT OF FISH AND WILDLIFE FOR LONGFIN SMELT

### **Advice for week of April 13, 2015:**

The Smelt Working Group does not have any Longfin Smelt-related advice based on recent information.

Barker Slough operations advice is not warranted at this time. The concern period for Barker Slough ended on March 31.

**Basis for advice:**

The 2009 State Water Project 2081 for Longfin Smelt states that advice to WOMT and the DFW Director shall be based on:

1. Adult Salvage – total adult ( $\geq 80$  mm) Longfin Smelt salvage (SWP+CVP) for December through February  $> 5$  times the Fall Midwater Trawl Longfin Smelt annual abundance index.
2. Adult abundance, distribution or other information indicates that OMR flow advice is warranted.
3. Larva distribution in the Smelt Larva Survey or the 20-mm Survey finds Longfin Smelt larvae present at 8 of 12 central and south Delta sampling stations in 1 survey (809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918, 919; see Figure 1).
4. Larva catch per tow exceeds 15 Longfin Smelt larvae or juveniles in 4 or more of the 12 survey stations listed.
5. During the period January 15 through March 31 of a dry or critically dry water year only, advice for Barker Slough pumping plant operations may be warranted if larval Longfin Smelt are detected at station 716 and other information indicates risk of entrainment.

**Discussion of Criteria**

1. As of April 12, 2015, no age-1 or adult Longfin Smelt have been salvaged for the water year. The Longfin Smelt adult salvage threshold for advice is  $> 80$  (see criterion in #1 above), which is based on a combined September through December Fall Midwater Trawl Longfin Smelt index of 16. The first juvenile Longfin Smelt of the season was detected at the CVP on March 26<sup>th</sup> and the second on March 29<sup>th</sup>. There is no criterion for larvae in salvage. No advice is warranted based on this criterion.

2. No new adult distribution information. Early April sampling by Bay Study detected no age-1 or adult Longfin Smelt in the San Joaquin River and only one age-1 fish in the Sacramento River. Kodiak Trawl sampling tends to be inefficient for Longfin Smelt, but in February the USFWS detected four adult Longfin Smelt at Jersey Point, compared to two adult Longfin Smelt at that location in January; none have been caught at Prisoner's Point. No other detections were made in the San Joaquin River or south Delta in January. In early January Bay Study detected Longfin Smelt adults in the Sacramento River at Rio Vista (station 761), a juvenile and adult in the Sacramento River at Sherman Lake (station 736), none in the San Joaquin River, and juveniles ( $< 80$  mm) and adults throughout Suisun Bay. During mid- to late February, Chipps Island trawling caught modest numbers of Longfin Smelt (19 and 16 for Feb 15-21 and 22-28), indicating the spawning run continues. Current distribution information does not indicate advice is warranted based on this criterion.

3 & 4. The last Smelt Larva Survey #6 of the season collected Longfin Smelt larvae at 4 locations in the central Delta (Table 1, Figure 1). Densities at these stations were slightly higher than in the past, but remain well below concern levels. The second 20-mm Survey sampled the week of March 30 and detected a substantially higher density of Longfin Smelt larvae at the boundary of the central Delta (station 809) and detected larvae at six locations in the central and

south Delta (8 detections needed to exceed distribution criterion). This too remained below concern levels. Two additional Longfin Smelt larvae were salvaged, one on April 5 at the SWP and one April 8 at the CVP. Continued collections in salvage are expected. Overall, catches in the central and south Delta were not sufficient to reach concern levels based on density or distribution.

5. Entrainment concern for Longfin Smelt larvae in Barker Slough ceased on March 31.

**Current conditions:** Sacramento River flow is about 6,900 cfs. X2 is well above 81. Combined State and federal exports are currently about 1,500 cfs. The 5-day OMR is -1,416 cfs with the Head of Old River Barrier installed; the OMR index is expected to range between -1,800 and -1,900 in the next week; if current Stanislaus River pulse flow reaches the Delta, OMR may go less negative temporarily. Qwest is -95 cfs but expected to become more negative over the week to -100 to -300 cfs.

**Summary of Risk:**

Risk of entrainment is very low in the south Delta. This results from both low densities of larvae (except at 809) and low exports in the south Delta. Risks of additional adult influx are very low and decreasing. Larva densities appeared to increase in the central Delta during 20mm Survey 2. Nonetheless, exports are very low and most larvae are believed to be outside of the region of entrainment, so risk of entrainment remains very low.

The limited number of Longfin Smelt larvae and post-larvae detected in the central and south Delta in SLS #6 and 20-mm Survey 2, the absence adults collected in the San Joaquin River or central Delta fish surveys and the absence of adult Longfin Smelt in salvage samples to date suggests few fish have moved into the central or south Delta for spawning. Current conditions, particularly OMR index projected between -1,800 and -1,900 for the week and only weakly negative Qwest, indicate very little risk for fish that do move into or hatch within the central Delta. The overall risk of entrainment remains very low.

Table 1. Longfin Smelt catches by station in Smelt Larva Survey 6, 2015. Sample processing is complete.

Year	Survey #	SLS Station	Sample Status	Species	Smelt Catch
2015	6	340	Not Sampled		
2015	6	342	Not Sampled		
2015	6	343	Not Sampled		
2015	6	344	Not Sampled		
2015	6	345	Not Sampled		
2015	6	346	Not Sampled		
2015	6	347	Not Sampled		
2015	6	348	Not Sampled		
2015	6	349	Not Sampled		
2015	6	405	Processed		No Smelt Catch
2015	6	411	Processed		No Smelt Catch
2015	6	418	Processed		No Smelt Catch
2015	6	501	Processed	Longfin Smelt	1
2015	6	504	Processed		No Smelt Catch
2015	6	508	Processed		No Smelt Catch
2015	6	513	Processed	Longfin Smelt	1
2015	6	519	Processed	Longfin Smelt	5
2015	6	520	Processed	Longfin Smelt	2
2015	6	602	Processed	Longfin Smelt	2
2015	6	606	Processed	Longfin Smelt	16
2015	6	609	Processed	Longfin Smelt	2
2015	6	610	Processed	Longfin Smelt	6
2015	6	703	Processed		No Smelt Catch
2015	6	704	Processed	Longfin Smelt	3
2015	6	705	Processed	Longfin Smelt	24
2015	6	706	Processed		No Smelt Catch
2015	6	707	Processed	Longfin Smelt	14
2015	6	707	Processed	Delta Smelt	1
2015	6	711	Processed	Longfin Smelt	1
2015	6	716	Processed	Delta Smelt	1
2015	6	723	Processed		No Smelt Catch
2015	6	801	Processed	Longfin Smelt	3
2015	6	804	Processed	Longfin Smelt	18
2015	6	809	Processed	Longfin Smelt	4
2015	6	812	Processed	Longfin Smelt	5
2015	6	815	Processed	Longfin Smelt	1
2015	6	901	Processed	Longfin Smelt	4
2015	6	902	Processed	Delta Smelt	3
2015	6	906	Processed		No Smelt Catch
2015	6	910	Processed		No Smelt Catch
2015	6	912	Processed		No Smelt Catch
2015	6	914	Processed		No Smelt Catch
2015	6	915	Processed		No Smelt Catch
2015	6	918	Processed		No Smelt Catch
2015	6	919	Processed		No Smelt Catch

SWP ITP Criteria Stations

Processing is complete through 4/2/15.

Table 2. Longfin Smelt catches by station in 20mm Survey 2 2015. Sample processing is incomplete.

Year	Survey	Station	Date	# Tows Processed	Species	Total Catch	Min Length	Max Length	Avg Length	
2015	2	323		0	Not Yet Processed	0				Suisun Bay & West
2015	2	340		0	Not Yet Processed	0				
2015	2	342		0	Not Yet Processed	0				
2015	2	343		0	Not Yet Processed	0				
2015	2	344		0	Not Yet Processed	0				
2015	2	345		0	Not Yet Processed	0				
2015	2	346		0	Not Yet Processed	0				
2015	2	405		0	Not Yet Processed	0				
2015	2	411		0	Not Yet Processed	0				
2015	2	418		0	Not Yet Processed	0				
2015	2	501		0	Not Yet Processed	0				
2015	2	504		0	Not Yet Processed	0				
2015	2	519		0	Not Yet Processed	0				
2015	2	602		0	Not Yet Processed	0				
2015	2	606		0	Not Yet Processed	0				
2015	2	609		0	Not Yet Processed	0				
2015	2	610		0	Not Yet Processed	0				
2015	2	508		0	Not Yet Processed	0				Confluence
2015	2	513		0	Not Yet Processed	0				
2015	2	520		0	Not Yet Processed	0				
2015	2	801		0	Not Yet Processed	0				
2015	2	804		0	Not Yet Processed	0				
2015	2	703		0	Not Yet Processed	0				Sac. River System
2015	2	704		0	Not Yet Processed	0				
2015	2	705	01-Apr-15	3	Longfin Smelt	6	8	15	12.17	
2015	2	706	01-Apr-15	3	Longfin Smelt	32	8	25	14.69	
2015	2	707	01-Apr-15	3	Longfin Smelt	4	13	16	14.25	
2015	2	711	01-Apr-15	3	Longfin Smelt	1	15	15	15.00	
2015	2	716		0	Not Yet Processed	0				
2015	2	718		0	Not Yet Processed	0				
2015	2	719		0	Not Yet Processed	0				
2015	2	720		0	Not Yet Processed	0				
2015	2	723		0	Not Yet Processed	0				
2015	2	724		0	Not Yet Processed	0				
2015	2	726		0	Not Yet Processed	0				
2015	2	809	30-Mar-15	3	Longfin Smelt	30	7	17	11.47	Central & South Delta
2015	2	812	01-Apr-15	3	Longfin Smelt	6	7	13	10.33	
2015	2	815	01-Apr-15	3	Longfin Smelt	1	14	14	14.00	
2015	2	901	30-Mar-15	3	Longfin Smelt	2	8	11	9.50	
2015	2	902	30-Mar-15	3	Longfin Smelt	4	8	13	10.75	
2015	2	906	01-Apr-15	3	Longfin Smelt	1	11	11	11.00	
2015	2	910	30-Mar-15	3	No Longfin Catch	0				
2015	2	912	30-Mar-15	3	No Longfin Catch	0				
2015	2	914	30-Mar-15	3	No Longfin Catch	0				
2015	2	915	30-Mar-15	3	No Longfin Catch	0				
2015	2	918		0	Not Sampled	0				
2015	2	919	01-Apr-15	3	No Longfin Catch	0				

Processing complete through 4/3/2015

Figure 1. CDFW's Smelt Larva Survey station locations.

